158. (New) A system as in claim 136, wherein information is encrypted for transmission over a wireless link between the first unit and second unit in the first or second period of time.

REMARKS

Claims 5-106 are pending in the reissue application at hand. Claims 5-106 were rejected as being based upon a defective reissue oath under 35 U.S.C. 251. A reissue declaration is being filed herewith that complies with 37 C.F.R. 1.175(a)(1) to overcome this rejection. Claims 6-7, 13, 31, 33-34, 41, 47, 52, 54, 56-58, 64, 66-69, 72, 75, 77-79, 81-83, 89, 92-94, 97, 100, 102-104, and 106 are being cancelled. Claims 5, 8-12, 14-18, 32, 35-40, 42, 44-46, 48, 51, 53, 55, 59-63, 65, 70, 73, 76, 80, 84-88, 90-91, 95-96, 98, 101, and 105 are being amended. Claims 107- 158 are being added. No new matter is being introduced.

Before responding to the specific rejections, Applicants believe that a brief discussion of the invention as now claimed and the cited reference (Gordon et al., U.S. Patent No. 5,577,026) may be useful.

The Applicants teach an invention related to a short-range wireless communications system applied to, for example, a miniaturized portable transceiver unit and a base unit transceiver. The miniaturized portable transceiver unit sends and receives information through magnetic induction to the base unit, which may also be portable (i.e., easily carried by hand by a single person). Similarly, the base unit sends and receives information through magnetic induction to the portable transceiver.

The base unit or the portable transceiver unit may include one or more transducers. The transducers may be a ferrite rod within a wire coil. Either or both of the units can include multiple transducers arranged in a variety of configurations to generate multiple magnetic fields and, in such multiple-transducer embodiments, a diversity circuit may be used to receive and/or transmit on at least one of the transducers. For example, three orthogonally arranged transducers can be used in the base unit, the portable unit, or both. In one embodiment, the multiple transducers are selectively operated based upon a strongest signal in order to limit power consumption. Fig. 7B of the application as originally filed is an example block diagram including the miniaturized portable transceiver unit ("Side A") and base unit

transceiver ("Side B"). Side A includes a single transducer 107 connected to an interface 106 that operates the transducer in transmit and receive modes. Side B includes multiple transducers 113 in x-y-z orientations, for example, connected to an interface 110 via an electronic switch network 112, which may be used to select at least one of the transducers to operate in transmit or receive mode. Thus, either the transducer systems of the miniaturized portable transceiver unit, base unit, or both, includes at least one transducer that functions as both a transmitter and a receiver, as recited in now amended Claim 5 ("at least one transducer of each of the first and second transducer systems functioning as a transmitter and a receiver of an inductive field"). In one embodiment, using at least one transducer at Side A and Side B, side A transmits to Side B in a first time slot and Side B transmits to Side A in a second time slot.

In contrast, Gordon et al. teach transferring data between a stationary first device and a second device adapted to rotate with respect to the first device via transducers that are used for transmitting or receiving, but not both. The first device communicates through use of a transmitter connected to an associated transducer and multiple receivers each connected to an associated transducer. The second device communicates through use of a corresponding receiver connected to an associated transducer and multiple transmitters each connected to associated transducers. In this manner, data is transfered from the stationary first device to the rotating second device through a first channel ("uplink"). Data is transmitted from the rotating second device to the stationary first device via two additional"downlink" channels (i.e., via the two transmitters to the two receivers) so as to provide simultaneous high speed data transfer from the second device to the first device at twice the rate of data transfer from the first device to the second device. Fig. 6 of Gordon et al. does not teach the first and second devices transmitting/receiving during associated time slots (channels), but only shows that there are multiple channels of communications, irrespective of how the transmissions are allocated in time. Thus, Gordon et al. do not teach a system in which at least one transducer in the system functions as a transmitter and receiver. Moreover, Gordon et al. teach away from a employing a transducer system that uses a transducer for transmitting and receiving. For example, in Gordon et al., each of the three channels are designed to be capable of operating independently with separate transmit and receive electronics, spatially separated antennas to minimize crosstalk, and, in the case of the uplink and downlink channels, two separate frequencies of

operation. Gordon et al. specifically do not teach a system that communicates in a time multiplexed manner through use of a sharing of antennas between transmitter and receiver elements, or any other elements within each device. Sharing of elements may be advantageous to reduce the size, cost and complexity of each device. Gordon et al teaches a system that may optionally time multiplex based on the desire to minimize crosstalk between uplink channels.

Gordon et al. further teaches that the two downlink channels are time multiplexed such that the amount of time that the two channels transmit simultaneously is advantageously only about one percent (Column 7, lines 38-53). With an overlap of one percent, the channel bandwidth of the two channels is substantially the same as a single channel. Since this same bandwidth could substantially be achieved with a single uplink channel, the teachings of Gordon et al. is substantially different from the time multiplexing claimed by the Applicants, which allows the number of components (e.g., transmitters, receivers and transducers) to be reduced.

Accordingly, because Gordon et al. do not teach every claim limitation of now amended Claim 5 ("at least one transducer of each of the first and second transducer systems functioning as a transmitter and a receiver of an inductive field"), the Applicants respectively submit that the rejection under 35 U.S.C. 102(e) should be withdrawn.

Dependent Claims 9, 35, 60, and 85 have been rewritten as independent claims and should now be in condition for allowance for reasons discussed in Part 9 of the Office Action at hand.

Dependent Claims 8, 10-12, and 14-30 have been amended to depend from Claim 9 and should be in condition for allowance for at least the same reasons.

Dependent Claims 32 and 36-40, 42-46, 48-51, 53, and 55 depend from Claim 35 and should be in condition for allowance for at least the same reasons.

Dependent Claims 59 and 61-63, 65, 70-71, 73-74, 76 and 80 depend from Claim 60 and should be in condition for allowance for at least the same reasons.

Dependent Claims 84 and 86-88, 90-91, 95-96, 98-99, 101, and 105 depend from Claim 85 and should be in condition for allowance for at least the same reasons.

New Claims 107-108 depend from Claim 5 and should be allowed for at least the same reasons discussed above in reference to Claim 5.

New Claim 109 includes limitations of Claims 6 and 14, as filed in the above-referenced preliminary amendment filed November 6, 2001. New Claim 110 includes limitations of Claims 6 and 22, as filed in the preliminary amendment. New Claim 117 includes the limitations of Claims 6 and 29 as filed in the preliminary amendment. Each of these claim combinations was allowed in Part 9 of the Office Action at hand and should be in condition for allowance. New Claims 111-117 depend from Claim 110 and should be in condition for allowance. Similarly, New Claims 119-120 depend from Claim 118 and should also be in condition for allowance.

New Claim 118 includes the limitations of Claims 31 and 38. New claim 122 includes the limitations of Claims 31 and 45. New Claim 123 includes the limitations of Claims 31 and 51. All of the "included" claims were filed in the preliminary amendment and allowed in Part 9 of the Office Action at hand. New Claims 124-125 depend from Claim 123 and should be in condition for allowance.

New Claim 126 includes the limitations of Claims 57 and 61. New claim 127 includes the limitations of Claims 57 and 65. New Claim 128 includes the limitations of Claims 57 and 70. New Claim 129 includes the limitations of Claims 57 and 76. New Claim 130 includes the limitations of Claims 57 and 77. All of the "included" claims were filed in the preliminary amendment and allowed in Part 9 of the Office Action at hand.

New Claim 131 includes the limitations of Claims 82 and 88. New Claim 132 includes the limitations of Claims 82 and 90. New Claim 133 includes the claim limitations of Claim 82 and 95. New Claim 134 includes the limitations of claims 82 and 101. New Claim 135 includes the limitations of Claims 82 and 102. All of the "included" claims was filed in the preliminary amendment and allowed in Part 9 of the Office Action at hand.

New Claim 136 includes similar limitations as Claim 5 and should be allowable for similar reasons as discussed above in reference to Claim 5. New Claims 137-158 depend from Claim 136 and should be allowable for at least the same reasons.

CONCLUSION

In view of the above amendments and remarks, it is believed that all pending claims (Claims 5, 8-12, 14-30, 32, 35-40, 42-46, 48-51, 53, 55, 59-63, 65, 70-71, 73-74, 76, 80, 84-88, 90-91, 95-96, 98-99, 101, 105, and 107-158) are in conditions for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned at (978) 341-0036.

Respectfully submitted,

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MARKED UP VERSION OF AMENDMENTS

Claim Amendments Under 37 C.F.R. § 1.121(c)(1)(ii)

5. (Amended) A method for magnetic induction time-multiplexed two-way short-range wireless communications, comprising:

during a first period of time, generating from a first unit with a first unit transducer system a first inductive field and receiving the first inductive field at a second unit with a second unit transducer system, the first transducer system including multiple transducers; and

during a second period of time, generating from the second unit with the second unit transducer system a second inductive field and receiving the second inductive field at the first unit with the first transducer system, the second transducer system including at least one transducer, at least one transducer of the first or second transducer systems functioning as a transmitter and a receiver of an inductive field.

8. (Amended) A method as in claim [7] 9 further comprising:

positioning each of the multiple transducers in the first unit to be uniquely oriented with respect to each other.

9. (Amended) [A method as in claim 7 further comprising] A method for communicating information over wireless links, the method comprising:

generating a varying magnetic field from a first unit during a first time slot to transmit information over a wireless link, the first unit including multiple transducers, at least one of which functions as both a transmitter and receiver of a varying magnetic field;

generating a varying magnetic field from a second unit during a second time slot to transmit information over the wireless link;

transmitting information from the second unit to the first unit; and

selecting a transducer of the first unit to generate a varying magnetic field depending on which of the multiple transducers in the first unit receives a strongest signal from the second unit.

10. (Amended) A method as in claim [8] 9 further comprising:

disposing a single transducer in the second unit for receiving information from the first unit and transmitting information from the second unit over the single transducer to the first unit.

11. (Amended) A method as in claim [6] 9 further comprising:

selecting a carrier frequency for transmitting information over the wireless link to avoid interference.

12. (Amended) A method as in claim [6] 9, wherein the first unit and second units are portable transceiver devices.

14. (Amended) A method as in claim [6] 9 further comprising:

transmitting termination bits at the end of a time slot.

15. (Amended) A method as in claim [6] 9 further comprising:

compressing the information for transmission during a time slot.

16. (Amended) A method as in claim [6] 9 further comprising:

modulating the information onto a carrier frequency for transmission during a time slot.

17. (Amended) A method as in claim [6] 9 further comprising:

encrypting the information for transmission during a time slot.

18. (Amended) A method as in claim [6] 9, wherein the first unit transmits to the second unit during the first time slot and the second unit transmits to the first unit during the second time slot.

32. (Amended) A method as in claim [31] 35, wherein the synchronization information is a header including multiple bit.

35. (Amended) [A method as in claim 34 further comprising] A method for communicating information over a wireless link, the method comprising:

from a first unit including multiple transducers uniquely oriented with respect to each other and at least one of which functioning as both a transmitter and receiver of a varying magnetic field, generating a varying magnetic field to transmit synchronization information and data information over the wireless link;

at a second unit, receiving the varying magnetic field and using the synchronization information to synchronize the second unit to receive the data information over the wireless link;

transmitting a signal from the second unit; and

selecting a transducer of the first unit to generate a varying magnetic field depending on which of the multiple transducers receives a strongest signal from the second unit.

36. (Amended) A method as in claim [34] 35 further comprising:

disposing a single transducer in the second unit for receiving information from the first unit and transmitting information from the single transducer in the second unit to the first unit.

37. (Amended) A method as in claim [31] 35, wherein the wireless link between the first unit and second unit supports two-way full duplex communication.

38. (Amended) A method as in claim [31] 35, wherein the first unit transmits information over one of three transducers and the second unit transmits and receives over a single transducer.

39. (Amended) A method as in claim [31] 35, wherein the second unit is disposed in a headset including a speaker and microphone, and the first unit is disposed in a cellular telephone device.

40. (Amended) A method as in claim [31] 35, wherein an orientation of the first unit and second unit changes over time.

42. (Amended) A method as in claim [31] 35, wherein the first unit is a portable transceiver device.

44. (Amended) A method as in claim [31] 35, wherein the first unit is coupled to a communications network and the wireless link is part of a logical connection between the second unit and the communications network.

45. (Amended) A method as in claim [31] 35 further comprising:

transmitting a signal from the second unit; and

detecting which of multiple transducers disposed in the first unit produces a strongest received signal from the second unit; and

generating a varying magnetic field in a time slot from the first unit on a transducer device oriented on similar axes as the transducer that produces the strongest received signal.

46. (Amended) A method as in claim [31] 35 further comprising:

at the second unit, receiving data information from the first unit following receipt of the synchronization information.

48. (Amended) A method as in claim [31] 35 further comprising:

utilizing a portion of the time slot to transmit synchronization information from the first unit to the second unit.

51. (Amended) A method as in claim [31] 35 further comprising:

tracking movements of the first unit relative to the second unit for maintaining communication over the wireless link.

53. (Amended) A method as in claim [31] 35 further comprising:

compressing the information for transmission over the wireless link in a time slot.

55. (Amended) A method as in claim [31] 35 further comprising:

processing data information received in a previous time slot while transmitting in a reverse direction in a following time slot.

59. (Amended) A system as in claim [58] 60, wherein the at least two transducers in the first unit are uniquely oriented with respect to each other.

60. (Amended) [A system in claim 58, wherein] A system for communicating information over wireless links, the system comprising:

a first unit including at least two transducers to transmit and receive and at least one of said at least two transducers functioning as both a transmitter and receiver of a varying magnetic field, the first unit generating a varying magnetic field during a first time slot to transmit information; and

a second unit including at least one transducer to transmit and receive, the second unit receiving the varying magnetic field during the first time slot to receive the information transmitted by the first unit, the second unit transmitting information to the first unit during a second time slot not overlapping with the first time slot, a transducer of the first unit [generates] generating a varying magnetic field depending on which of the at least two transducers receives a strongest signal from the second unit.

61. (Amended) A system as in claim [58] 60, wherein a single transducer is disposed in the second unit for receiving information from the first unit and transmitting information to the first unit.

62. (Amended) A system as in claim [57] 60, wherein the wireless link between the first unit and second unit supports two-way full duplex communication.

63. (Amended) A [method] system as in claim [57] 60, wherein the first unit transmits information over one of three uniquely oriented transducers and the second unit transmits and receives over a single transducer.

65. (Amended) A system as in claim [57] 60, wherein an orientation of the first unit and second unit changes over time due to motion of a user.

70. (Amended) A system as in claim [57] 60 further comprising:

a first circuit to detect which of multiple transducers disposed in the first unit produces a strongest received signal from the second unit; and

a second circuit to generate a varying magnetic field in a time slot from the first unit on a transducer device oriented on a similar axes as the transducer that produces the strongest received signal.

73. (Amended) A system as in claim [57] 60, wherein a portion of the time slot is used to transmit synchronization information from the first unit to the second unit.

76. (Amended) A system as in claim [57] 60, wherein movements of the first unit relative to the second unit are tracked for maintaining communication over the wireless link.

80. (Amended) A system as in claim [57] 60, wherein data information received in a previous time slot is processed while other data information is transmitted in a reverse direction in a following time slot.

84. (Amended) A system as in claim [83] <u>85</u>, wherein the at least two transducers in the first unit are uniquely oriented with respect to each other.

85. (Amended) [A system in claim 83, wherein] <u>A system for communicating information over a wireless link, the system comprising:</u>

<u>a first unit including at least two transducers to transmit and receive and at least one of said at least two transducers functioning as both a transmitter and receiver of a varying magnetic field, the first unit generating a varying magnetic field to transmit synchronization information and data information over the wireless link; and</u>

<u>a second unit including at least one transducer to transmit and receive, the first and second units being movable relative to each other, the second unit receiving the varying magnetic field and using the synchronization information to receive the data information over the wireless link,</u> a transducer of the first unit [generates] <u>generating</u> a varying magnetic field depending on which of the at least two transducers receives a strongest signal from the second unit.

86. (Amended) A system as in claim [83] <u>85</u>, wherein a single transducer is disposed in the second unit for receiving information from the first unit and transmitting information to the first unit.

87. (Amended) A system as in claim [82] <u>85</u>, wherein the wireless link between the first unit and second unit supports two-way full duplex communication.

88. (Amended) A method as in claim [82] <u>85</u>, wherein the first unit transmits information over one of three uniquely oriented transducers and the second unit transmits and receives over a single transducer.

90. (Amended) A system as in claim [82] <u>85</u>, wherein an orientation of the first unit and second unit changes over time due to motion of a user.

91. (Amended) A system as in claim [82] 85, wherein a carrier frequency is selected for transmitting information over the wireless link to avoid interference.

95. (Amended) A system as in claim [82] 85 further comprising:

a first circuit to detect which of multiple transducers disposed in the first unit produces a strongest received signal from the second unit; and

a second circuit to generate a varying magnetic field in a time slot from the first unit on a transducer device oriented on a similar [axes] axis as the transducer that produces the strongest received signal.

96. (Amended) A system as in claim [82] 85, wherein the first unit detects which of multiple transducers receives a strongest signal in a previous time slot to transmit on the transducer in a following time slot.

98. (Amended) A system as in claim [82] 85, wherein a portion of the time slot is used to transmit synchronization information from the first unit to the second unit.

101. (Amended) A system as in claim [82] 85, wherein movements of the first unit relative to the second unit are tracked for maintaining communication over the wireless link.

105. (Amended) A system as in claim [82] 85, wherein data information received in a previous time slot is processed while other data information is transmitted in a reverse direction in a following time slot.